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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,577	09/19/2002	Bernard H Kear	Kear-2	9692

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DUANE MORRIS LLP
100 COLLEGE ROAD WEST, SUITE 100
PRINCETON, NJ 08540-6604

EXAMINER

BAREFORD, KATHERINE A

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 07/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/049,577

Applicant(s)

KEAR ET AL

Examiner

Katherine A. Bareford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,6-16 and 21-33 is/are rejected.
- 7) ☒ Claim(s) 2-5 and 17-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The amendment of June 18, 2003 has been received and entered.

The Examiner notes that in the Remarks section of the June 18, 2003 amendment, applicant indicates that claims 9 and 24 were canceled during Phase II of the PCT examination and requests clarification of the claims being examined (see page 6, first paragraph). The Examiner notes that in the claims provided to the Examiner for the examination of this case, claims 9 and 24 were not canceled, and are in fact still pending (claim 24 was amended with the June 18, 2003 amendment). If applicant wishes to cancel these claims, an amendment should be filed in order to provide this cancellation. As to the other claims pending, applicant appears to be working off the same claims the Examiner has, since the material indicated in the marked-up copy of the amended claims as being the original material corresponds to the claims used by the Examiner.

Claim Objections

2. The objection to claim 16 because of informalities is withdrawn due to applicant's amendment to claim 16.

Specification

3. The Examiner notes the abstract provided with the June 18, 2003 amendment.

Double Patenting

4. The Examiner notes that after the June 18, 2003 amendment, claims 21-28 are no longer duplicates of claims 6-12 and 15.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 16 and 21-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Connolly et al (US 5120693).

Connolly teaches a method of making a powder. Column 1, lines 5-10. As a ceramic-ceramic powder, it would be capable of being used in a thermal spray apparatus. Column 2, lines 55-65. Micron scale particles of a hard phase material are blended with non-scale particles of a binder phase material. Column 2, lines 55-65, column 20, lines 5-15, and column 5, lines 25-60. The binder phase material can be a ceramic, silica. See column 2, lines 60-65. The powder mixture is aggregated to bond the different particles together. Column 5, line 25 through column 6, line 15 (note that the blended powders are first agglomerated by spray drying and then calcined by heat treating, which would produce "aggregates" within the meaning used by applicant).

Claims 21, 22, 27: the particles are agglomerated by spray drying before aggregating by heat. Column 5, lines 45-50.

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Claim 22: the final particle aggregate size can be 40 microns, for example. Column 5, lines 45-50.

Claim 23: the hard phase material is a ceramic. Column 5, lines 20-40.

Claim 24: the binder phase material can be a ceramic, silica (SiO_2). See column 2, lines 60-65.

Claims 25, 26: the micron scale particles can be 50 to 90 percent of the aggregate by weight, which would be inclusive of, for example, 70 volume percent. Column 10, lines 5-20.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 6-15 and 28-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Connolly as applied to claims 16, ^{and 21-27} ~~27~~ above, and further in view of WO 97/18341 (hereinafter '341).

Connolly teaches all the features of these claims except (1) the thermal spraying of the feedstock to form a coating (claims 1, 29), (2) the selective melting during spraying (claim 13), (3) the cooling rate (claim 14) and (4) the particular materials of the particles (claims 15, 28, 30, 31, 33).

However, '341 teaches the thermal spraying of agglomerated particles to form wear resistant coatings. Page 5, lines 10-20. The particles are agglomerated from nanostructured particles. Page 5, lines 10-20. '341 further teaches that when spraying nanoparticle agglomerates, the nanoparticle grains and the binder will all rapidly dissolve, while when spraying larger particles surrounded by a matrix phase, the matrix will melt, but the larger particles will undergo little size change and result in a porous coating. See page 9, lines 10-30 and figures 4A and 4B. '341 teaches that the materials sprayed can be WC/Co agglomerates, for example. See page 8, lines 10-25.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Connolly to use the formed particles in thermal spraying processes as suggested by '341 with an expectation of producing desired ceramic coatings, because Connolly teaches providing agglomerated ceramic powders, and '341 teaches that it is conventionally known to thermal spray agglomerated powders. It further would have been obvious to use the micron/nano scale particle combination as taught by Connolly when selective melting is desired during spraying, such as to provide a porous coating, because of the selective melting taught to be conventional by '341 when using particles larger than nanoparticle sized. As to the cooling rate, it would have been obvious to control the cooling rate to provide the desired final structure, because of the teaching of Connolly to control the temperature to prevent destroying the crystal structure of the particles during processing (see column 5, lines 25-40). Furthermore, it would have been obvious that the particles with the micron/nano scale combination as taught by Connolly would desirably be made with other ceramic/metal or ceramic/ceramic combinations

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based on the desired final product, because of the teachings in '341 of the variety of materials that can be agglomerated together to form thermal spraying particles.

Allowable Subject Matter

9. Claims 2-5 and 17-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The cited prior art above does not teach or suggest that the micro-scale particles are in the form of "aggregates" in the blending step, where by "aggregates" it is meant that "the particles are clusters of bonded together particles that cannot be easily separated from one another by mechanical means" (as defined by applicant at page 6, last paragraph, of the specification). Instead, Connolly indicates that in the blending step, agglomeration by spray drying occurs. As discussed by applicant on page 7, first paragraph, spray drying would provide agglomerates that are capable of being mechanically separated.

Response to Arguments

10. Applicant's arguments filed June 18, 2003 have been fully considered but they are not persuasive.

Applicant argues that as to the 35 USC 102(b) rejection using Connolly, that Connolly does not provide the claimed aggregated particles. Instead, applicant argues that Connolly describes making silica bonded spray dried agglomerates (note column 5, lines 27-48), and does

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not expressly or inherently describe the aggregating step of independent claim 16 because Connolly does not make aggregated particles. The Examiner has reviewed this argument, however the rejection of claims 16 and 21-27 is maintained. While applicant has defined "aggregate" as "clusters of bonded particles that cannot be easily separated from one another by mechanical means" (page 6, last paragraph) and "agglomerate" as "capable of being mechanically separated" (page 7, first paragraph), and applicant may be his own lexicographer, this definition only applies to applicant's disclosure. Therefore, the mere fact that Connolly uses the term agglomerate does not necessarily mean that agglomerates within applicant's definition are provided. The plain meaning of agglomerate would be "to gather into a ball, mass or cluster" or "a jumbled mass or collection"; and aggregate would be "to collect or gather into a mass or whole" (Webster's Ninth New Collegiate Dictionary, 1990, page 64). Thus, even though Connolly uses the term agglomerate, an aggregate as defined by applicant could be provided. When the process of Connolly is reviewed, the Examiner finds that Connolly first blends the micron-scale and nano-scale particles into an agglomerate by spray drying (this corresponds to the process of applicant at page 7, first and third paragraphs, where spray dried agglomerates are first formed) (see Connolly, column 5, lines 25-65). Then the spray dried agglomerates are calcined at elevated temperatures. Column 5, lines 25-40 and column 6, lines 1-15. While these calcined particles are still called agglomerates by Connolly, this process corresponds to the process of applicant at page 7, third paragraph, where spray dried agglomerates are heat treated to bond the particles together and form aggregates. Thus, Connolly by its spray drying, followed by calcining at elevated temperatures, would inherently provide blending to agglomerates followed by forming

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aggregates within the meaning of applicant, since similar process steps are followed and the calcining of the particles would make them "clusters of bonded particles that cannot be easily separated from one another by mechanical means".

As to the 35 USC 103 rejection of claims 1, 6-15 and 28-33, applicant takes the position discussed with regard to the 35 USC 102(b) rejection above, that Connolly does not teach aggregation as claimed. Applicant further argues that '341 does not cure the deficiencies of Connolly. As to product claims 29-33, applicant further argues that Connolly does not provide "micron-scale particles of a hard phase material fused together with the binder phase material" as required by claim 29, because they merely teach agglomerated powders. The Examiner has reviewed these arguments, however, the rejections are maintained. As regarding Connolly's teaching of agglomeration vs. aggregation, as discussed in regard to the 35 USC 102(b) rejection, it is the Examiner's position that Connolly teaches aggregation as claimed. As a result, the resulting product, as in claim 29, would also contain fused together materials as claimed. Furthermore, even if the particles were thermally sprayed as agglomerates, it appears that fusing as claimed would occur, because '341 indicates the melting of the nanoparticles during spraying conditions, and this melted material would fuse with the larger micron-scale material.

Conclusion

11. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (703) 308-0078. The examiner can normally be reached on M-F(7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


KATHERINE A. BAREFORD
PRIMARY EXAMINER
GROUP 1100 1700